



## Revamp the NTP Bioassay

I would like to congratulate J. Carl Barrett on his recent objective editorial, "Prevention of Environmentally Related Diseases." I believe that Dr. Barrett has outlined the basis for a forward-looking program that would make even as overt a critic of the National Toxicology Program (NTP) as myself agree that changes can be instituted that would make the current structure serve a useful purpose. However, I believe that Dr. Barrett has not fully recognized the extent of the changes required to meet his ultimate desires. Unfortunately, it is generally believed that cancer epidemiology is unable to determine a practical negative finding. Once a compound has been labeled as a carcinogen by an NTP bioassay, it is considered to be a potential hazard by a major segment of society. It is difficult to visualize how epidemiological cohort studies as suggested by Dr. Barrett can ever dispel the societal problems raised by a positive bioassay in the laboratory.

I would suggest that in order to implement most of Dr. Barrett's suggestions for more studies on mechanisms and better approaches to bioassays, the current NTP bioassay program should be completely revised. Rather than using contract laboratories to undertake predetermined rote studies, the funds should be used to establish new units at universities and a major effort should be made to attract some of the better brains in basic cancer research into the area.

The belief that cancer could be controlled largely by removing chemical carcinogens from the environment was initially promoted by cancer research workers. Since it has become obvious, as Dr. Barrett points out, that this approach has not borne fruit, the pursuit of environmental carcinogens has been relegated to the back burner by the majority of the cancer research community. Perhaps further dialogue, such as that presented in this stimulating editorial, can reverse this trend.

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## Response

I would like to thank Dr. Shubik for his supportive comments concerning my editorial. In my editorial, I was trying to emphasize ways that cancer epidemiology and toxicological testing can be used in concert. I do realize, however, the limitations of epidemiology, which is why epidemiology and toxicology need to be complementary disciplines. It is important to verify (if possible) chemicals found to be positive in rodent tests by studies of exposed human cohorts. This will greatly improve our ability to design and interpret appropriate animal tests to predict human risks.

The importance of Dr. Shubik's suggestion of funding NTP-related research at universities has already been recognized by the NIEHS. We recently issued a request for grant applications (RFA) on "mechanistically based alternative methods in toxicology." In addition, during the past year NIEHS funded projects in response to a grants solicitation to involve academic scientists in NTP-related research on "toxic substance effects on developmental gene expression." Other relevant targeted programs include RFAs on cellular effects of low-frequency electromagnetic fields and effects of 60 Hz electromagnetic fields *in vivo*. The institute also plans to initiate a program of small grants to fund mechanistic studies to complement NTP testing protocols. I would also like to draw attention to our workshop on mechanism-based toxicology, which was held 11–13 January 1995 at the NIEHS. Finally, I share with Dr. Shubik the desire to make prevention research a high priority of cancer researchers by further dialogue of the strengths and limitations of various approaches to this important area of research.

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## We Stand Corrected

Two of the articles in the October 1994 issue of *EHP* (102:10) contain errors and omit relevant information:

- The article, "A Creeping Suspicion about Radon" (pp. 826–830), states that "1 gram of uranium emits 1 curie of radiation." One gram of *radium*, i.e., Ra-226, is roughly equivalent to one curie of activity. The curie is a measure of radioactivity; the radiation emitted depends on the decay scheme of the specific radionuclide of interest. Numerous radionuclides emit several different types and energies of radiation per decay.

- The same article also ignores the research results obtained by Bernard Cohen of the University of Pittsburgh on the health effects of radon. Cohen's study of the correlation between average radon levels in 1600 U.S. counties and the incidence of various types of cancers shows that there is essentially no correlation between average radon levels and cancer incidence. In fact, his results show a *negative correlation* between average radon levels and lung cancer incidence, even when smoking prevalence is taken into account [see *Health Physics*, 65:529–531 (1993)].

- The article, "Alternatives to Incineration" (pp. 840–845), quotes Robert Prince of GTS Duratek as saying that "Some glass brought back from the moon was 70 billion years old" (p. 842). Current estimates place the age of the universe somewhere between 8 billion and 16 billion years.

- "Alternatives to Incineration" also fails to mention numerous other alternative technologies for destruction and encapsulation of hazardous chemical and/or biological wastes, such as electron beam linear accelerators, molten salt oxidation, mediated electrochemical oxidation, molten metal processing, and polyethylene encapsulation.

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## Erratum

In the Correspondence in the January issue (vol. 103, no. 1), the affiliation of Beck et al. (pp. 15–17) was incorrectly listed as Gradient Corporation in Ann Arbor, Michigan. Beck et al. are affiliated with Gradient Corporation in Cambridge, Massachusetts.